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hours a day, and when she comes off she is too tired to do anything but sleep. But even the private duty nurse should have an avocation, something that builds up her ability to create, something that fills her soul, something that helps her into the realm of beauty and something that she understands and has an interest in outside of nursing. Work is hard in these modern times; the responsibility is great. We have come into a new stage of consciousness. We touch the ends of the earth and we are responsible for the ends of the earth, because of our widened contacts, and it is not a cheerful or easy outlook. The ends of the earth are in a fearful snarl, and it bears down upon us as a terrible burden. Only by nervous balance, only by sane outlook, only by sleep enough, only by rational standards for health, can we meet the demands of this present day.

THE IMPORTANCE OF UNDERSTANDING MEDICAL LABORATORY TESTS

By Mabel McVicker, R.N.
Peter Bent Brigham Hospital, Boston, Mass.

TOO frequently the student nurse, and often the graduate head nurse, looks upon a "test" as something which has to be done because the doctor has ordered it, and feel a relief when it is over, so that the routine work of the ward may go on without interference, but if she might only know the significance of the test—and there is always a way of knowing—and remember that by being an assistant with it, she may be an aid in making a diagnosis and so directly help the patient, then surely she will work with interest, enthusiasm, and one hundred per cent of accuracy so far as her work is concerned in any test.

Let us consider, for example, two of the comparatively new medical tests. First, the Glucose Tolerance test. This is considered by many physicians an aid in the diagnosis of early cases of diabetes. Glucose tolerance means that a known amount of glucose is administered to an individual and then it is determined how efficiently it is utilized by the body tissues by estimating the height to which the blood sugar rises, and whether or not sugar appears in the urine. The patient fasts after 7 p. m. of the evening before the day of the test. The reason for this is that it has been found that if other food stuffs are being absorbed at the same time as the sugar, more of the latter can be tolerated than when the sugar alone is being absorbed.

The patient is weighed that evening. In the morning, a specimen of blood is taken to determine the amount of sugar present, after which a solution of glucose is given by mouth, allowing 1.5 grams of glucose per kilogram of body weight. For each gram of glucose, 3 cc. of water or weak coffee are allowed. If water is used, the juice of a lemon may be added. After taking the glucose, the remainder of the water or coffee is given.

The patient voids urine before taking the glucose, then once every hour, using separate containers, for three hours. The amount of sugar in the blood is determined not only before the administration of the glucose but also at the end of three-quarters of an hour, and at the end of two hours, after the glucose has been given.

After a patient has fasted twelve hours, the normal amount of sugar in the blood averages between 100 and 120 milligrams per 100 cc. of blood. If at any time during the test it rises above this, it should return to normal within two hours after the taking of the glucose. Experiments have shown that an individual with a low sugar tolerance has a rapid rise in the blood sugar (often to .2 per cent or greater) and it remains high for an hour or so, not returning to the fasting level until from three to five hours; while in a normal individual, after the ingestion of a similar amount of glucose, the blood sugar rises rapidly to about .15 per cent and returns to normal in about two hours.

During the test, the urine is tested for sugar in order to determine which specimen, if any, contains glucose. A normal person should not show any sugar in the urine. It has been shown that of the three proximate principles of food, carbohydrate is the most available for combustion in the body and may be considered as the quickly available food for the body furnaces, and a healthy animal organism is capable of rapidly oxidizing large quantities of carbohydrate.

"When the limit to the amount of carbohydrate that the organism can metabolize is overstepped, some of it appears in the urine. The amount that can be tolerated without causing glycosuria is commonly known as the *assimilation or saturation limit*."[1]

In the majority of healthy individuals there is no trace of glucose in a 24-hour specimen of urine after the ingestion of 200 grams of the glucose and frequently none after as much as 500 grams have been taken. "The testing of the so-called assimilation limit has been considered an important aid in the diagnosis of early cases of diabetes." If, during the glucose tolerance test, the blood sugar "curve" does not return to normal within two hours and glucose is found to be present in the urine specimens, the patient is said to have a "decreased sugar tolerance."

Second, the Meltzer-Lyon test. This is used in the diagnosis of diseases of the gall bladder and biliary ducts. The nurse has ready on the day of the test the following outfit: 1-20 cc. sterile syringe; 1 sterile specimen glass; 1 tumbler of sterile water; 1 sterile glass tip to medicine dropper and 1 glass connecting tube; 5 sterile bottles; 5 sterile stoppers; 100 cc. of magnesium sulphate 25 per cent solution (sterile); 1 sterile Rhefus or duodenal tube; adhesive tape (to fasten the tube and prevent slipping); kidney basin (for vomitus, if any); washed gauze (for patient's use).

No food is allowed the patient from midnight of the day preceding the test until its completion. The reason for this is that the microscopic findings in the fasting contents of the stomach and duodenum may be of diagnostic value;

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[1] Physiology and Biochemistry in Modern Medicine, MacLeod.

also, in the fasting state, the sphincter of the common bile duct should be closed. The patient's mouth is washed out thoroughly with an alkaline antiseptic mouth wash. This procedure, together with having the patient fast and the use of sterile material, helps to keep the stomach and duodenum free from residue which might be confusing when the microscopic examination is done.

The Rhefus tube is inserted about 8 a. m., and the fasting (gastric) contents withdrawn to the sterile specimen glass. A small amount of water is left in the stomach to stimulate peristalsis, the patient lies on the right side (with a pillow under the hips) and the tube is swallowed and permitted to pass into the duodenum. The first fasting duodenal contents is aspirated into a sterile bottle. It usually takes about twenty minutes for the tube to pass into the duodenum.

The 100 cc. of magnesium sulphate is then injected through the tube into the duodenum. Dr. Meltzer, in his experiments, found that "it (a local application of a 25 per cent solution of magnesium sulphate) may relax the sphincter of the common duct and permit the ejection of bile, and, perhaps, even permit the removal of a calculus of moderate size wedged in the duct in front of the Ampulla of Vater." Because of this effect, magnesium sulphate solution has been introduced into the duodenum by means of the duodenal tube to induce drainage of the bile ducts in cases where such treatment seemed to be indicated; e. g., in catarrhal jaundice.

During the test, after the solution of magnesium sulphate has been introduced into the duodenum, using the syringe, the duodenal contents are again aspirated into a second sterile bottle. The glass connecting tube permits the color of the fluid being withdrawn to be seen and in a few minutes the magnesium sulphate solution ordinarily begins to be stained with bile; this first bile is yellowish in color. In a few moments, the color changes, and the bile becomes darker and more viscid; this new bile is allowed to run into a third sterile bottle. This is usually followed by a lighter colored bile which is thinner and more transparent and this is collected in the last sterile bottle. Dr. Lyon believes the first bile to be that contained in the common duct; the second darker colored bile, to be almost entirely from the gall bladder; and the third kind of light yellow transparent bile, found in normal individuals, to be that which has been freshly secreted by the liver cells.

The diagnosis is made on the microscopic findings in the specimens obtained—pus, blood cells, mucus, bacteria, etc.; on the promptness with which the biles appear, the amounts withdrawn, the frequency of the discharges, and the general appearance of the material as to color, consistency, viscosity, etc.

To be sure, the work for the nurse in the above medical tests, as in most tests, is to prepare the equipment, and see that the specimens are properly labelled and sent promptly to the right place for examination, but surely these are important and most necessary to the successful carrying out of any test. In tests similar to the duodenal test, is it not the nurse who usually can reassure the patient so that she will follow the doctor's instructions?